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Leukaemia Section
Short Communication

t(2;22)(p23;q11.2)

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Clinics and pathology

Disease

Translocations involving 2p23 are found in more than half cases of anaplasic large cell lymphoma (ALCL), a high grade non Hodgkin lymphoma (NHL). They involve ALK, and are therefore called ALK+ ALCL.
The most frequent ALK+ ALCL being the the t(2;5)(p23;q35) with NPM1 -ALK fusion protein, which localises both in the cytoplasm and in the nucleus.
The t(2;22)(p23;Q11.2) is very rare, and, like other t(2;Var) involving various partners and ALK, the fusion protein has a cytoplasmic localization; they are therefore called "cytoplasm only" ALK+ ALCL. However, in case of a t(2;22) the localization is restricted to granules (vesicles) in the cytoplasm.

Phenotype/cell stem origin

CD30+; ALK+.

Clinics

Found in 1 case (a 3 yr old girl in complete remission 1yr after end of treatment), perhaps 2 (a 52 yr old man).

Genes involved and proteins

ALK

Location
2p23

Protein
1620 amino acids; 177 kDa; glycoprotein (200 kDa mature protein) ; membrane associated tyrosine kinase receptor.

CLTCL1

Location
22q11.2

Protein
1640 amino acids, 187 kDa; component of the coat of vesicles originated from the plasma membrane or the golgi.

Result of the chromosomal anomaly

Hybrid gene

Description
5' CLTCL1 - 3' ALK.

Fusion protein

Description
2197 amino acids, 248-250 kDa; 1634 (nearly all the CLTCL1 protein) N-term amino acids from CLTCL1, fused to the 562 C-term amino acids from ALK (i.e. the entire cytoplasmic portion of ALK with the tyrosine kinase domain).

Expression / Localisation
Cytoplasmic localization restricted to granules.

Oncogenesis
Constitutive autophosphorylation.

References

Kedra D, Peyrard M, Fransson I, Collins JE, Dunham I, Roe BA, Dumanski JP. Characterization of a second human clathrin heavy chain polypeptide gene (CLH-22) from chromosome 22q11. Hum Mol Genet. 1996 May;5(5):625-31

Drexler HG, Gignac SM, von Wasielewski R, Werner M, Dirks WG. Pathobiology of NPM-ALK and variant fusion genes in anaplastic large cell lymphoma and other lymphomas. Leukemia. 2000 Sep;14(9):1533-59

Stein H, Foss HD, Dürkop H, Marafioti T, Delsol G, Pulford K, Pileri S, Falini B. CD30(+) anaplastic large cell lymphoma: a review of its histopathologic, genetic, and clinical features. Blood. 2000 Dec 1;96(12):3681-95

Touriol C, Greenland C, Lamant L, Pulford K, Bernard F, Rousset T, Mason DY, Delsol G. Further demonstration of the diversity of chromosomal changes involving 2p23 in ALK-positive lymphoma: 2 cases expressing ALK kinase fused to CLTCL (clathrin chain polypeptide-like). Blood. 2000 May 15;95(10):3204-7

Delsol G, Ralfkiaer E, Stein H, Wright D, Jaffe E. Anaplastic large cell lymphomas, Primary systemic (T/Null cell type). WHO Classification of Tumors. Pathology and Genetics of tumours of Haematopoietic and Lymphoid Tissues . 2001 pp 230-235.

Morris SW, Xue L, Ma Z, Kinney MC. Alk+ CD30+ lymphomas: a distinct molecular genetic subtype of non-Hodgkin's lymphoma. Br J Haematol. 2001 May;113(2):275-95

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